
III. King County Travel Demand Forecasting Model

The King County travel demand model with 1300 travel analysis zones (TAZ) was developed in 2001 with assistance of consultants. The land use and network data of King County travel model are consistent with the Puget Sound Regional Council (PSRC) travel model. The model was updated in 2003 based on new 2000 Census data and adopted GMPC land use data for King County Comprehensive Planning use.

King County travel demand forecasting model, like most travel models in the U.S., involves four submodels: trip generation, trip distribution, mode choice, and traffic assignment.

- **Trip Generation:**
In the cross-classification trip generation process, the land use quantities and household demographics in each TAZ are translated into person trip ends by trip purpose using trip generation rates for each land use variable.
- **Trip Distribution**
Trip distribution is used to forecast the number of trips from a particular zone to every other zone by trip purpose. The distribution is based on the number of person trip ends generated for each of the two zones and on factors that relate the likelihood of travel between any two zones to the travel time (or cost) between two zones.
- **Mode Choice**
Mode choice estimates the proportions of the total person trips using transit, ridesharing, and single occupant vehicles for travel between each pair of zones. Vehicle driver splits for the entire King County travel model area are taken directly from PSRC forecasting.
- **Traffic Assignment**
In the traffic assignment submodel, an origin/destination trip table is developed to reflect vehicle trips from one zone to another for the analysis period. These trips are then assigned to travel routes available between the zones with separate assignments for single occupant and multi-occupant vehicles. The King County travel demand model uses three time periods (AM peak period, PM peak period, and off-peak period). PM peak hour assignments are factored from the PM peak period.

A. Network Development

Base Network

The Y2003 base year model network includes all roadway improvements completed through the summer of 2003. The primary foundation for the base year network is a field survey conducted during the summer of 2001. This field survey collected data on the number of lanes and speed limits for all arterials within King County, northern Pierce County, and southern Snohomish County. This work was supplemented by a more targeted field survey of programmed capital projects conducted in August of 2003 to confirm if they were indeed open as scheduled.

Y2022 Committed Network

The Y2022 forecast year committed transportation network includes projects anticipated to be complete by 2022. It represents the minimum roadway network alternative and is used to help identify additional needs. Projects for the committed network were selected from the following sources:

1. Destination 2030, Puget Sound Regional Council, May 2003. Selected projects include those identified for completion by 2022.
2. Projects observed as under construction during the August 2003 field survey.
3. The 2003-8 Capital Improvement Program, Road Services Division, King County Department of Transportation.
4. State projects funded out of the recently-enacted, five-cent increase in the statewide gasoline tax.
5. Selected projects identified by the Regional Transportation Investment District.

The final project list includes major widening projects that add general purpose or HOV lanes to existing roadways, entirely new roadways, or new interchanges connecting to limited-access freeways. The project list does not include operational projects at intersections, signalization, minor widening, major maintenance, or projects that only benefit transit and/or nonmotorized modes. While the majority of projects on the Y2022 list are within King County, major capacity improvements in the areas bordering King County within Pierce and Snohomish Counties were also included. Additionally, any capacity improvement to a limited-access freeway anywhere in Pierce or Snohomish County was included.

Alternative Networks

Alternative networks will be developed for 2022 to address needs identified from the analysis of the committed network. These will be used along with other information to develop the Transportation Need Report which is the transportation capital facilities element of the Comprehensive Plan.